MODELS
85-86-850

Majestic
"MIGHTY MONARCH OF THE AIR"

8 TUBE
3 BAND RADIO

INSTRUCTION MANUAL

INSTALLATION

SHIPPING BOLTS

Underneath the shelf which holds the radio in the console model are two bolts with red nuts which are used for shipping purposes only. Remove the bolts so that the radio is floating freely on its rubber supports.

AERIAL AND GROUND

For best results an outdoor antenna, approximately sixty feet long including the lead in wire, should be used. An inside antenna will prove satisfactory in large cities provided it is not installed in a building of steel construction. In all cases, however, the receiver will perform better when an outdoor antenna is used. Install the antenna as high as possible and be sure to avoid running the wire through trees or near metal obstructions upon which it can rub. The antenna should also be installed at right angles to power lines, street car lines and any other electrical apparatus if possible. The receiver is designed to operate efficiently on foreign broadcasting stations and short wave bands with the conventional type aerial. For those who are especially interested in short wave reception, however, slightly less noise will be heard on the short wave bands if a noise eliminating antenna is used. The receiver will operate without a ground connection but it is advisable to use a good ground to insure quiet noise free reception. The ground wire should be connected to a water pipe or radiator or a pipe driven into the ground. When it is connected to the radiator or water pipe be sure that the paint is first scraped from the pipe so that a good metallic contact is obtained. The antenna and ground wires should be connected to the two terminals on the back of chassis marked A for antenna and G for ground.

It is extremely important that a good antenna and ground be used if the receiver is to operate properly. Connections should all be clean and tight, and periodically an inspection should be made to see whether the wires are corroded from the affects of the weather. It is not advisable to use an old antenna on a new set.

TUBES

Your radio set comes to you with the tubes already in the sockets. When it becomes necessary to replace the tubes, the type and position of each tube is shown in figure 1. A similar tube socket guide is also pasted in the cabinet. The base of the tubes have a guide pin so that they can not be inserted incorrectly. Be sure that you rotate the tube before attempting to insert it so that the guide pin drops into the center hole in the socket. Be sure that the tubes are pressed tightly in place and that the flexible wires with grid clips on the end are placed over the caps of the tubes which appear as shown in the illustration.

POWER LINE VOLTAGE

Your radio is designed to operate on 105 to 125 volts, 50 or 60 cycle a.c. supply only. A few sections of the country use other voltage and cycles. If there is any doubt in your mind, do not plug the set in until you first determine the voltage and cycles from your power supply company.

Part No. 16803

HOW TO USE YOUR RADIO

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The sketch shown in figure 1 indicates the various tuning controls. Read carefully how to use each control so you can obtain the fullest benefit from your radio.

TURNING RADIO ON

Turn the on-off switch and volume control (see figure 1) to the right. As the switch is turned on, a click will be heard and the dial will light up. Wait approximately half a minute for the tubes to warm up. To turn the radio off the volume control knob should be turned back to the left until the dial light goes out.

TUNING IN STATIONS

(BROADCAST BANDS)

First turn the band indicator knob to the broadcasting band. This knob does not turn as easily as the others. Next turn the volume control to the right to a position of medium volume. The tuning control knob should then be turned until the station is heard.

TUNING EYE

The tuning eye is mounted at the top of the dial service to indicate when the station is correctly tuned. The tuning knob should be turned back and forth over the station until the dark portion of the eye is at the narrowest point. You will notice that as you tune off a station the dark portion of the eye rapidly broadens. The volume should never be adjusted by tuning slightly off the station. Instead, the best tuning point should always be found by using the tuning eye and volume reduced to the desired level by turning the volume control to the left.

SHORT WAVES

This receiver has two short wave tuning bands. The intermediate band will receive police calls, aeroplanes and amateurs from all parts of the country. The shortest wave band will receive many foreign short wave broadcasting stations and also American short wave stations re-broadcasting chain programs.

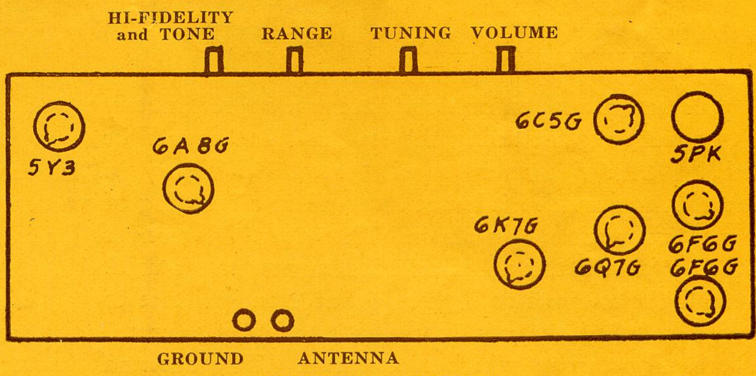
The tuning and operation on the short wave bands is the same as for the broadcast band except that it is important that the tuning knob be turned very slow. Short wave stations are extremely sharp, particularly the foreign broadcasters because of the great distance, as a result they will be missed unless the receiver is tuned with extreme care. You will notice that the approximate location of the most important foreign broadcasters are shown on the dial.

WAVE BAND INDICATORS RADIO BEAM TUNING

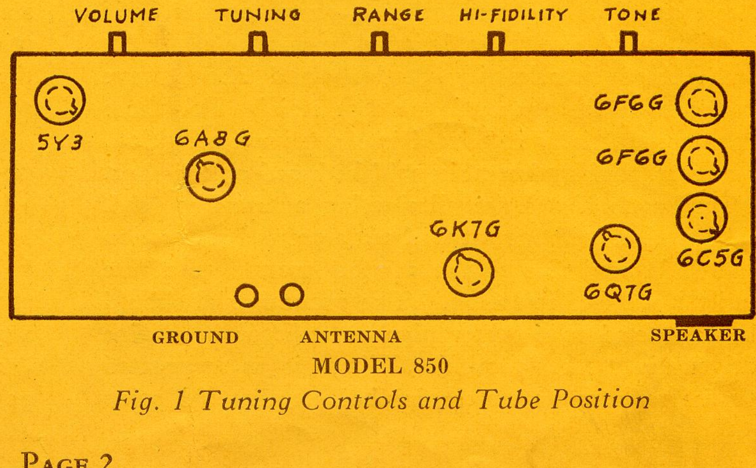
There are two indicators by which the different bands are shown on your radio. The indicator at the bottom of the dial tells you which band is being used. In addition to make it still easier, the traveling light of the radio beam tuning which serves as a tuning pointer is automatically shifted from one band to the next as the wave band switch is turned.

BALANCE WHEEL TUNING

To aid in easy tuning of foreign stations which require an extremely fine balance of tuning mechanism a balance wheel is used. You will notice that the tuning control has a very soft feel that makes the tuning smooth and easy. The use of the balance wheel makes possible also speedy tuning of the broadcast band when traveling from one station to another. The knob can be spun with the fingers so the pointer will travel quickly from one station on the dial to



MODELS 85 AND 86



MODEL 850

Fig. 1 Tuning Controls and Tube Position

another. When you use the spinning action, however, never spin the dial hard against the stops at each end of the tuning bands.

TONE CONTROL

When the station is tuned in, the tone control can be adjusted to any tone desired. By rotating the tone control knob to treble position, full brilliancy of the broadcast is obtained. Usually this position is desirable for speaking. The intermediate position and extreme bass are liked by many people for music.

HIGH FIDELITY CONTROL

The receiver is equipped with a "high fidelity" control which is used to provide an extension of tone range.

Normally, when tuning in a signal the switch is set at the counter-clockwise or normal position. After the station is properly tuned in the switch is turned to "Hi-Fidelity" or clockwise position. Operating in this way provides for better signal selection and tone quality.

The improvement in tone quality and range will be noticed more when listening to orchestral selections in which the tone range extends from 60 to 5000 cycles or more.

WEATHER CONDITIONS AFFECT RECEPTION

It is not always possible even on a new set to expect perfect reception. In many cases poor reception may be due to local interference or to weather conditions. We will briefly discuss some of the conditions that can affect reception.

STATIC

Static is usually due to local thunder storms which shows itself as a series of clicks and cracks. It is of course more prevalent during the summer months and in some localities may make reception of distant stations quite bad.

LOCAL INTERFERENCE

Local interference is sometimes troublesome in radio. It is found most frequently when the receiver is located close to a power line or street car wires. It can also be caused by ex-ray machines, electric fans, dirty light socket contacts, vacuum cleaners, and electric refrigerators. Most electrical appliances when in good condition will not cause interference to your radio. However, when they begin to get old and contacts become loose or corroded, they will often cause loud cracking noises in your radio. Local interference can be reduced and sometimes can be eliminated by keeping the antenna and also the leadin away from electrical apparatus or by the use of a special noise eliminating antenna.

Where the trouble is very serious it may be advisable to call in your local service man to locate the source of the noise.

AUTOMATIC VOLUME CONTROL

Your receiver is equipped with an automatic volume control which tends to keep the stations volume from fading. For this reason as the dial indicator is tuned from one station to another, static will increase substantially between stations. This only indicates that the automatic volume control is operating properly. Do not confuse it with local interference.

FADING

Fading will be noticed more particularly on distant stations. It consists of the station changing its volume from high to low. If the station is fading badly the automatic volume control may not be able to hold the volume constant. When this occurs a different station should be tuned in.

STATION INTERFERENCE

On the standard broadcast band, there are as many as six stations operating at one time on a single channel. Although these stations are located in different sections of the country, during good weather conditions they may over-lap one another so that several stations can be heard at the same time. This is especially noticeable on the high frequency end of the broadcast band. This interference often results in stations combining with one another to form a whistle, a high shrill squeal or a deep growl.

CARE REQUIRED FOR BEST OPERATION

There are no adjustments of any kind to be made on the chassis or speaker except those provided for professional service men. It is advisable, however, to occasionally remove the tubes and have them checked at a reputable radio shop. Tubes should be replaced at least one a year if the fullest performance of the receiver is expected.

REPLACING DIAL LAMPS

Three 6.3 volt dial lamps are used. Two lamps are clipped to the bottom of the dial and one is in the traveling indicator. To remove the pilot lamp from the traveling indicator, it should be first rotated slightly to one side of the dial. The light and socket can then be pulled out of the housing. The two lights at the bottom of the dial can be slipped off the clips for replacement.

AJUSTMENTS FOR SERVICE MEN ONLY

ALIGNMENT PROCEDURE

Correct alignment is of extreme importance in all-wave receivers. The receivers are properly aligned at the factory with precision equipment and realignment should not be attempted by the service technician until all other causes of faulty operation are corrected.

In order to properly realign the receiver the following equipment is necessary:

1. A signal generator which will provide an accurately calibrated signal at any frequency from 456 kilocycles to 18 megacycles. The generator should have adjustable signal output.
2. An output audio voltmeter of the low voltage type to be connected across the moving coil of the speaker. This should be capable of providing a readable deflection for relatively low output levels to avoid the effects of overload.
3. An insulated or non-metallic screw driver for the adjustment of trimmers.

I F ALIGNMENT 456 KC

1. Connect the output meter (low scale) across the loud speaker voice coil. Turn the wave band switch to broadcast position. Turn the volume control to its maximum position.
2. Connect the test oscillator ground to chassis and the "hot" lead from the test oscillator to the grid of the 6L7 converter tube through a series .1 Mfd. condenser. Set test oscillator to 456 KC.

Models 85 and 86 have a two point selectivity or high fidelity control associated with the tone control. This adjustment should be set for highest selectivity during alignment. Highest selectivity is obtained when the switch at the end of the tone control action is in its left or counterclockwise position.

Model 850 has this same control as a separate adjustment (second knob from the left). This adjustment should also be in its left hand or counterclockwise position during alignment.

3. Adjust I F alignment screws of second I F transformer adjacent to 6F6 power tube to maximum output, reducing output of test oscillator to keep the meter reading on scale as alignment proceeds.
4. Adjust alignment of first I F transformer, (directly behind tuning condenser) to maximum output as described above.
5. Readjust these trimmers for accurate alignment. Always use the lowest possible output from the test oscillator to preclude the possibility of automatic volume control action confusing proper adjustment.

NOTE: Since coils are used in series it is absolutely necessary to align the high frequency bands first, in the order indicated.

FOREIGN BAND 5.7 TO 18.5 MEGACYCLES

1. With test oscillator connected to the antenna and ground terminals through a 400 ohm resistor set oscillator at 16 megacycles.
2. Set the dial scale to 16 megacycles and adjust the oscillator trimmer condenser (C 4) to a resonance using the counterclockwise or low capacity point.
3. Adjust input circuit trimmer (C 5) to maximum response, rocking the gang condenser back and forth a degree or two to obtain proper maximum.

POLICE OR MIDDLE BAND 1.75 TO 5.8 MEGACYCLES

1. With the test oscillator connected as above set the oscillator and dial to 5.5 megacycles.
2. Adjust oscillator trimmer condenser (C 6) for maximum response using the counterclockwise or low capacity point.
3. Adjust input circuit trimmer (C 7) to maximum response rocking the gang condenser as described above.

BROADCAST BAND 535 TO 1800 KC

1. With test oscillator connected to antenna and ground through a 200 Mfd. condenser set oscillator and receiver dial to 1600 kilocycles.
2. Adjust broadcast oscillator trimmer (C 8) to obtain maximum response.
3. Adjust antenna circuit trimmer (C 9) for maximum output.
4. Adjust preselector trimmer (C 10) for maximum output.
5. Set test oscillator and dial to 600 kilocycles and tune in the signal, then adjust broadcast band padding condenser (C 11) for maximum output This padder is mounted on the aluminum coil deck near the panel and is adjusted through a hole provided in the back of the chassis pan. Rock the condenser back and forth a degree or two in order to obtain proper maximum.
6. Repeat the 1600 KC adjustments described above for greater accuracy.

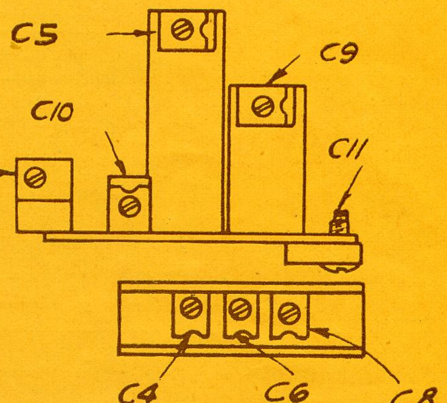
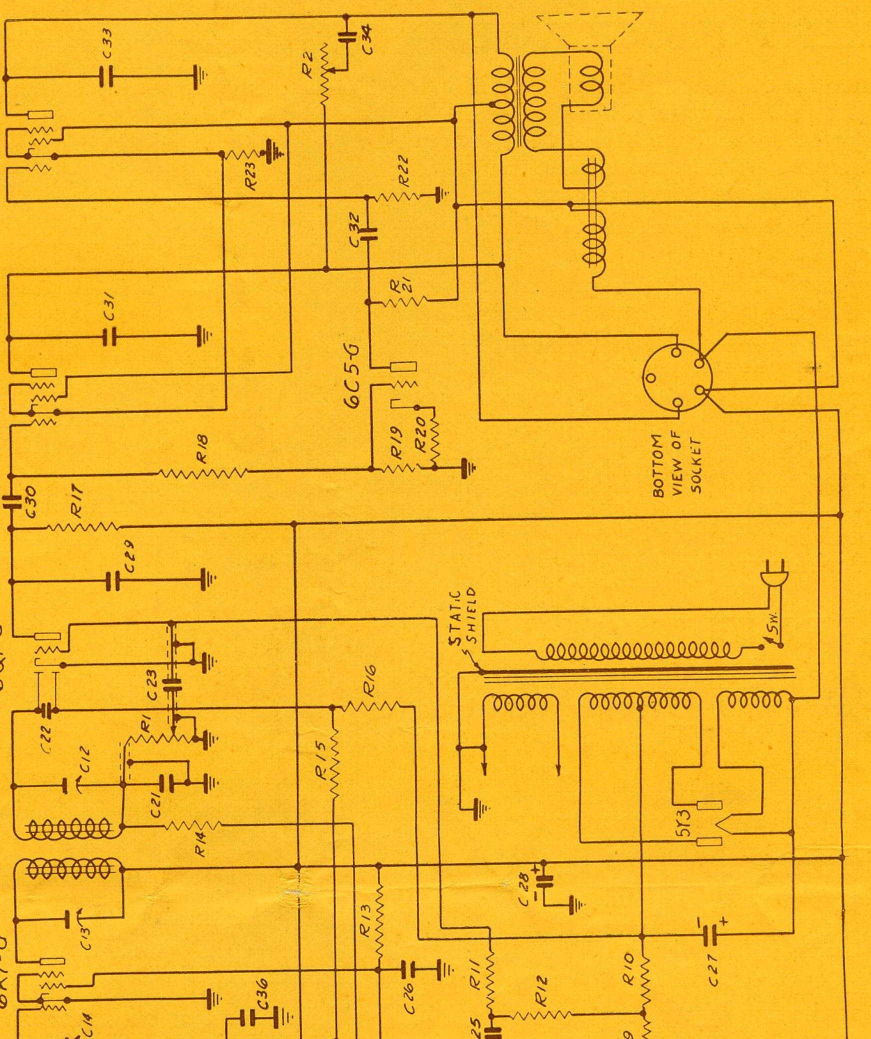


Fig. 2 Location of Trimmers

SCHEMATIC WIRING DIAGRAM



REPLACEMENT PARTS MODELS 85-86-850

SCHEMATIC LOCATION	PART No.	DESCRIPTION	PRICE
	15089	Bulb pilot light (edgelight) model 85-86	$ .11
	16589	Bulb pilot light frosted (travelite)	.12
	16885	Bulb pilot light (edgelight) model 850	.11
C1 C2 C3	B-16461-3	Condenser, variable gang model 85-86	2.52
C1 C2 C3	A-16543-2	Condenser, variable gang model 850	2.52
C11	A-16472	Condenser, padder 340 uuf 960 uuf	.28
C4 C6 C8	A-16473	Condenser, trimmer 3-30 uuf triple strip	.22
C7	A-15246-2	Condenser, trimmer 3-30 uuf (bakelite base)	.08
C5 C9 C10	A-16474	Condenser, trimmer 3-30 uuf (ceramic base)	.09
C27	A-15236-3	Condenser, wet electrolytic 25 mfd. 400 volts	.90
C28	A-15237-2	Condenser, wet electrolytic 10 mfd. 300 volts	.55
C29	15918	Condenser, mica 100 mfd. +—20% type O	.07
C21	15928	Condenser, mica 250 mfd. +—20% type O	.08
C20 C22	15929	Condenser, mica 50 mmfd. +—20% type O	.07
C17	15930	Condenser, mica 2000 mmfd. +—20% type W	.14
C18	15931	Condenser, mica 4300 mmfd. +—5% type W	.26
C19	15932	Condenser, mica 1750 mmfd. +—5% type W	.17
C16 C36	15752	Condenser, tubular .05 mfd. 200 volts	.09
C31 C33	15753	Condenser, tubular .002 mfd. 600 volts	.08
C23 C30 C32	15754	Condenser, tubular .01 mfd. 400 volts	.08
C35	15757	Condenser, tubular .1 mfd. 400 volts	.11
C24	15763	Condenser, tubular .01 mfd. 200 volts	.07
C34	15764	Condenser, tubular .03 mfd. 400 volts	.08
C25	15770	Condenser, tubular .2 mfd. 200 volts	.11
C26	15773	Condenser, tubular .2 mfd. 400 volts	.14
R2	B-16539-2	Control, tone with high fidelity switch (model 85-86)	.70
R2	B-16540-2	Control, tone (model 850)	.46
	A-16541-2	Control, high fidelity (model 850)	.21
R1	B-16542-2	Control, volume	.62
	16742	Coil and mounting assembly (model 85-86)	5.00
	16796	Coil and mounting assembly (model 850)	5.00
	16789	Dial glass and pyralin backing (model 85-86)	.90
	16790	Dial glass and pyralin backing (model 850)	1.05
	16851	Drive and indicator assembly (model 85-86)	3.50
	16715	Drive and indicator assembly (model 850)	4.55
	B-16617	Escutcheon No. 3 (model 85-86)	1.05
	B-16618	Escutcheon No. 4 (model 850)	1.25
	A-16597	Knob (tune and band switch) model 85-86	.18
	A-16598	Knob (volume and tone) model 85-86-850	.11
	A-16599	Knob (band switch) model 850	.15
	A-16596	Knob (tune and high fidelity) model 850	.18
R13	15501	Resistor, carbon 25,000 +—20% 1 watt	.07
R12	15511	Resistor, carbon 50,000 +—20% ¼ watt	.05
R17	15512	Resistor carbon 250,000 +—20% ¼ watt	.05
R8	15515	Resistor, carbon 100,000 +—20% ¼ watt	.05
R14 R15 R16 R24	15517	Resistor carbon 1 meg. +—20% ¼ watt	.05
R7	15542	Resistor, carbon 1,000 +—20% ¼ watt	.05
R22	15554	Resistor, carbon 500,000 +—10% ¼ watt	.05
R4	15558	Resistor, carbon 10,000 +—20% ½ watt	.05
R11	15559	Resistor, carbon 3 meg. +—20% ¼ watt	.05
R3	3320	No. 38 D. C. C. Manganin wire 2 ohms	.05
R18	15604	Resistor, carbon 435,000 +—10% ¼ watt	.05
R19	15605	Resistor, carbon 100,000 +—10% ¼ watt	.05
R20	15606	Resistor, carbon 5,000 +—10% ½ watt	.05
R23	15607	Resistor, carbon 250 +—10% 2 watt	.16
R12	15608	Resistor, carbon 50,000 +—10% ¼ watt	.05
R6	15552	Resistor, carbon 30,000 +—20% ¼ watt	.05
R9 R10	A-16564	Resistor candohm 27.5 and 15 ohms .245 watts	.19
	16886	Shield pilot light	.05
	15062	Socket speaker	.08
	15066	Socket 6K7	.11
	15083	Socket 6C5	.11
	15084	Socket 6F6	.11
	15099	Socket 5Y3	.07
	16469	Socket 6Q7	.11
	16537	Socket 6A8	.11
	B-16635	Socket 6G5 with leads	.45
	A-16881	Socket pilot light (edgelight) R. H. model 850	.09
	A-16883	Socket pilot light (edgelight) L. H. model 850	.09
	A-16879	Socket pilot light (top) model 85-86	.09
	A-16888	Socket pilot light (bottom) model 85-86	.09
	16783	Socket pilot light travelite	.11
	C-16584-2	Speaker (model 85-86)	4.60
	C-16585-2	Speaker (model 850)	6.55
	B-16548-2	Transformer, 1st I. F.	1.70
	B-16549	Transformer, 2nd I. F.	1.55
	C-16544-4	Transformer, Power 110 v. 50-60 cycles (model 85-86)	3.25
	C-16545-3	Transformer, Power 110 v. 50-60 cycles (model 850)	3.10
	A-1954	Washer, felt (large)	.01
	A-1955	Washer, felt (small)	.01

VOTAGE CHART

POSITION	TUBE	Ef	Ek	Eg SCREEN	Eg SUPPRESSOR	Ep TRIODE	Ep PENTODE
Converter	6 A8G	6.3	3.0	110.0			225.0
I. F. Amplifier	6 K7G	6.3	3.0	110.0			230.0
Detector—AVC	6 Q7G	6.3	2.0			95.0	
Phase Inverter	6 C5G	6.3	7.0			150.0	
Power Output	6 F6G	6.3	14.0	230.0			225
Power Output	6 F6G	6.3	14.0	230.0			225
Rectifier	5 Y3	5.0					